

## FUNGI OF GREECE IV: Species of Uromyces and Pileolaria

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In previous articles on the Fungi of Greece, the rusts on species of Compositae, of Euphorbiaceae and the species of *Puccinia* have been enumerated.\*\* In the present article, twenty-eight species of *Uromyces* found on fifty-six host plants are described. Many of the host plants are endemic to Greece and many new host records for rusts are noted.

The contractions O, I, II and III in the citations of collections are the standard ones for spermogonia, aecia, uredosori and teleutosori. M. Pantidou's collectors numbers are enclosed in brackets. The specimens are deposited in the herbarium of the Benaki Institute of Phytopathology, Athens, with duplicates of most of them in the Edinburgh herbarium (E).

### ANACARDIACEAE

#### *Pileolaria terebinthi* (DC.) Cast.

On *Pistacia terebinthus* L. I (uredinoid) (222), Katsimidi, Attica; II & III (322), Skiathos; II (307), Samos.

Aecia without spermogonia, hypophyllous, on large pustular spots on slightly swollen portions of the host leaf, aeciospores  $26-32$  ( $28$ )  $\times$   $21-24$  ( $23$ )  $\mu$ , wall  $3-4 \mu$  thick, densely verruculose (verrucae  $1 \mu$  apart); uredosori hypophyllous, scattered, small, c.  $1$  mm in diameter, not associated with swollen spots on the host leaves; uredospores  $25-32$  ( $28$ )  $\times$   $22-27$  ( $23.5$ )  $\mu$  with 2 equatorial pores, wall  $3-4 \mu$  thick, sparsely verruculose (verrucae  $2-4 \mu$  apart); teleutosori mainly epiphyllous,  $3-4$  mm all over the leaf surface, causing reddening of the host tissue, covered by the host epidermis, dark brown, erumpent, confluent; teleutospores  $20-29 \times 26-33 \mu$ , wall  $4.5-6 \mu$  thick, orange-brown, strongly verrucose; pedicels up to  $350 \mu$  long and  $6 \mu$  wide, yellow near the spore, the rest hyaline.

This fungus has been reported in Greece by Maire and Politis (1940) on the same host and by Sarejanni (1936) on *Pistacia vera*. The existence of uredosori and caeomoid aecia, differing both macroscopically and in the degree of ornamentation of the walls of their respective spores has been overlooked by many European workers but is clearly noted for *Pileolaria* in North America in Arthur's Manual.

### CARYOPHYLLACEAE

#### *Uromyces behenis* (DC.) Unger

On *Silene vulgaris* (Moench) Garcke (*S. inflata* Sm., *S. cucubalus* Wib.) I, III (14), Tripes, Mantinia; I, III (70), Milina, Pelion; II (228), Skopelos; II (249), Skiathos; II (431), Peratata, Kefallinia; I, III (448), Agios Gera-

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simos, Kefallinia; I, II, III (466), Mt. Pendeli, Attica; II, III (518), Kerkyra; on *S. ionica* Hal. II (453), Kefallinia.

Spermogonia not found; aecia in groups on dried spots, hypophyllous, peridia white, lacerate; aeciospores  $15-20 \times 14-16\mu$ , wall  $0.6-1\mu$  thick, hyaline or pale yellow, peridial cells with walls  $3-3.5\mu$  thick, strongly striate, centre densely echinulate; uredosori absent in some collections, rare or abundant in others, amphigenous, minute ( $0.2-0.5$  mm), erumpent, pulverulent, orange cinnamon, growing apart from the teleutosori; uredospores  $20-24$  ( $26$ )  $\times 16-22\mu$ , wall  $1.8-2.6\mu$  thick, yellow-brown, finely echinulate, pores 3, 4 or rarely 5, some with a clear area around them; teleutosori often developing around the aecia; amphigenous and caulicolous, long-covered by the greyish host epidermis, brown-black; teleutospores  $25-27$  ( $33$ )  $\times 20-24\mu$ , subglobose to ovoid, wall  $3\mu$  thick at the sides, up to  $9\mu$  thick at the apex, almost smooth, orange-brown, pore mostly apical; pedicels persistent, pale yellow, up to  $70\mu$  long, thick-walled near the spore.

The collections on *S. vulgaris* are rather puzzling. Some have the stages I, III as expected for *U. behenis* but one from Attica has I, II, III, one from Kerkira II, III and several only II. The uredosori seem to be typical and not acidoid. The presence of uredosori with typical *U. behenis* has for long been a source of uncertainty and has often been dismissed as chance infection by the uredo stage of *Puccinia behenis*. But it is rather improbable that the II stage in our material could belong to this other rust (*Puccinia behenis*) since the wall of the uredospores have 4 or more pores whereas in *P. behenis* there are often fewer (3-4) pores. Besides, in one collection (518) from Kerkyra the uredosori occur together with the teleutosori of *Uromyces*. Guyot (1958) mentioned a collection from Tunis also on *Silene vulgaris* carrying a few uredosori and his description of the II stage fits ours. He discussed the possibility that *U. behenis* and *U. inaequaltus* are one species and doubted the validity of separating them. In our opinion this position is not justified since the morphology of the uredospores in the two species is different.

The collection on *S. ionica*, which is endemic in Greece, is classified under *U. behenis* because of the similarity in the morphology of its uredospores to the other collections. The solitary II stage on *Silene* seems to be common in Greece and has been collected from many localities.

#### *Uromyces dianthi* (Pers.) Niessl.

On *Dianthus* sp. (cultivated) II, III (25) Kiphisia, Attica; II, III (109), Athens.

Uredospores  $20-27 \times 18-22\mu$ , wall  $3-3.5\mu$  thick, almost smooth, yellow-brown, pores 3, equatorial; teleutospores  $25-30$  ( $34$ )  $\times 22-27\mu$ , wall  $3-3.5\mu$ , pore apical with a slight pale papilla. Sori parasitized by *Darluca*.

#### *Uromyces doricus* Maire

On *Silene fabarioides* Haussk. III (536), Mt. Mourgana, Epirus.

Teleutosori amphigenous,  $0.5-0.8$  mm, cinnamon brown, erumpent, pulverulent; teleutospores  $22-26$  ( $30$ )  $\times 18-22$  ( $24$ )  $\mu$ , wall  $3-3.5\mu$  thick, dark brown, verrucose; the verrucae  $1.2-1.5\mu$ , spaced  $1.8-2.4\mu$  apart, pore apical with a pale yellow cap making total wall up to  $6\mu$  at the apex; pedicels hyaline, fragile.

*S. fabarioides* has not been reported previously with rust. *U. doricus* Maire has been collected and described by Maire from Greece on *Silene paradoxa*. However, his material carried both uredo and teleutosori. There are at least two other described species in this affinity, *Uromyces cuenodii* Maire and *U. silenae-ponticae* Const., but we have seen material of neither for direct comparison. From published descriptions alone it does not seem possible to distinguish them from *Uromyces doricus* with any degree of certainty.

### ***Uromyces gypsophilae* Cooke**

On *Saponaria calabrica* Guss. (*S. graeca* Boiss.) II, III (515) Mt. Pantokrator, Kerkyra; II, III (537), Agios Pantes, Epirus; II, III (541), Mt. Mourgana, Epirus.

Uredosori not present; uredospores mixed with teleutospores,  $20-26 \times 18-24(26)\mu$ , mostly globoid, wall  $1.8-2.4\mu$  yellow-brown, densely echinulate or verrucose, pores two or three, more or less equatorial; teleutosori amphigenous and caulicolous, abundant, erumpent, pulverulent, often confluent in long rows, brown-black; teleutospores orange-brown, globoid to subgloboid to ellipsoid,  $26-30(33) \times 20-24\mu$ , wall  $3.5-4.2\mu$  thick, apex with a pale yellow cap  $5-6\mu$  thick; pedicels hyaline, fragile.

*Saponaria calabrica* is a new host for *U. gypsophilae*. Apparently this rust is rare on *Saponaria* and the only records are by Sydow (1910) on *Vaccaria pyramidata* (*S. vaccaria*) from Asia and Henderson (1964) on *S. orientalis*.

The rust appears to be common in the western part of Greece.

### ***Uromyces verruculosus* Schroeter**

On *Arenaria serpyllifolia* L. II, III (528), Mt. Mourgana, Epirus; on *Silene graeca* II, III (902), Laconia.

Uredosori amphigenous, 1 mm diam., erumpent, pulverulent, orange to cinnamon; uredospores  $24-28 \times 22-24\mu$ , wall  $1.5-2\mu$  thick, yellow-brown, pores mostly four, scattered; teleutosori mainly on the stems, 1 mm, erumpent, pulverulent, dark brown; teleutospores  $24-32 \times 23-26\mu$ , wall  $2.5-4\mu$  thick, yellow-brown, verrucose, pore apical with a pale, flat papilla; pedicels hyaline, mostly fragile, some persistent and up to  $26\mu$  long.

The species of *Uromyces* common on *A. serpyllifolia* are *U. arenariae* and *U. arenariae-grandiflorae*, both microcyclic and teleutospores with different morphology. Two other species of *Uromyces* found less commonly on *Arenaria* are *U. dianthi* and *U. verruculosus*. Our material fits best the last species in that the uredospores have 4-5 pores and verrucose teleutospores (in *U. dianthi* pores mostly 3 equatorial and teleutospores echinulate), although the size of the teleutospores is rather large for *U. verruculosus* and closer to *U. dianthi*.

*U. verruculosus* is apparently rare on *Arenaria*; the only record found is by Savulescu (1953 p.601) (with III and II) on *A. serpyllifolia* var. *viscida*.

## GERANIACEAE

### ***Uromyces geranii* (DC.) Lév.**

On *Geranium rotundifolium* L. O, I, II, III (69), Hania, Mt. Pelion; on *G. macrorrhizum* L. O, I (268), Hania, Mt. Pelion.

Spermogonia few, large, honey-colored; aecia hypophyllous, in groups along the nerves and on the petioles, causing distortion; aeciospores  $20-33 \times 17-24\mu$ , hyaline or pale yellow, verrucose; uredosori hypophyllous, minute, pulverulent, cinnamon; uredospores  $22-28 \times 20-24\mu$ , wall  $2\mu$  thick, echinulate with one equatorial pore; teleutosori similar but dark brown; teleutospores  $25-40$  (44)  $\times 16-24\mu$ , wall smooth, brown, pore apical with pale yellow papilla up to  $5\mu$  high; pedicels hyaline, fragile.

*G. rotundifolium* and *G. macrorrhizum* are new hosts for *U. geranii* in Greece.

#### GRAMINEAE

##### *Uromyces dactylidis* Otth

On *Poa trivialis* subsp. *silvicola* II, III (503), Mt. Parnis, Attica; on *Poa bulbosa* L. III (423), Kefallinia; II, III (818), Crete; on *Ranunculus ficaria* L. (*Ficaria grandiflora* Rob.) O, I (25), Trypes, Mantinia; O, I (819), Crete.

*P. bulbosa* and *P. trivialis* are new hosts for Greece. There is always a possibility that aecia on *Ranunculus ficaria* may belong to *Uromyces rumicis* but the collections cited lack the refractive granules on the aeciospore walls typical of *U. rumicis* and so agree rather with *U. dactylidis*.

#### LEGUMINOSAE

##### *Uromyces anthyllidis sensu lato*

Under this aggregate species we treat a number of long-recognised but, in the main, morphologically indistinguishable taxa whose taxonomic revision is long-overdue. A. L. Guyot followed the same course in his study of the genus *Uromyces* on Leguminosae.

##### a) *Uromyces anagyridis* (Rouss.) Roum.

On *Anagyris foetida* L. II, III (462), Kefallinia.

Uredosori hypophyllous, pale orange; uredospores  $20-24 \times 15-22\mu$ , wall  $2-3\mu$  thick, pale to dark brown; teleutosori together with uredosori or separate, mostly hypophyllous, minute, brown-black, erumpent, pulverulent; teleutospores as typical in *U. anthyllidis*.

This rust is common in Greece.

##### b) *Uromyces anthyllidis* Schroet. *sensu stricto*

On *Anthyllis vulneraria* L. II, III (130), Mt. Parnassos; II, III (410), Mt. Pendeli, Attica; II, III (427), Kefallinia; on *Dorycnium graecum* (L.) Ser. II (71), Zagora, Pelion; II (225), Skiathos; on *Medicago arabica* All. II, III (393), Skopos, Zakynthos; II, III (409), Kastro, Zakynthos; on *M. truncatula* Gaern. II, III (36), Milies, Pelion; II, III (37), Milina, Pelion; on *M. turbinata* (L.) All. II, III (395), Skopos, Zakynthos; on *Trifolium campestre* Schreb. III (66), Milina, Pelion; on *Trifolium* sp. II, III (238), Skiathos.

In all the above collections the uredosori and teleutosori are amphigenous,  $0.5-2$  mm, the first cinnamon, the second brown-black; uredospores  $20-24 \times 18-22\mu$ , wall  $2-3.5\mu$  thick, pale yellow to yellow, pores  $4-6$ ; teleutospores

globose to ovoid,  $18-24 \times 15-20\mu$ , wall  $2.5-3\mu$  thick, yellow brown, densely verrucose with a small apical papilla; pedicels hyaline, fragile. *D. graecum* is a new specific host for the rust. The rust generally reported on *Medicago truncatula* is *U. striatus* but our collections seem to be *U. anthyllidis*. The last has been found on *Anthyllis dillenii* (Sydow, 1935) and *A. tetraphylla* (Sulidu, 1939) in Greece but not on *A. vulneraria*. *Medicago turbinata* is also a new record for Greece.

c) *Uromyces bonaveriae* Syd.

On *Securigera securidaca* (L.) Deg. & Doerfl. (*Bonaveria securidaca* (L.) Rchb.) II, III (52), Milina, Pelion; II, III (76), Zagora, Pelion; II, III (254), Alonisos; II, III (398) Zakynthos.

The morphology of the uredospores and teleutospores is the same as in typical *U. anthyllidis*.

d) *Uromyces gurkeanus* P. Henn.

On *Lotus angustissimus* var. *minor* Bornm. & Rech. fil. II (236), Skiathos; on *L. creticus* L. II, III (572), Crete; on *L. ornithopodioides* L. II, III (253), Alonissos; III (345), Ithaki; II, III (349), Ithaki; II, III (380), Zakynthos.

This rust is part of the *U. anthyllidis* complex which has been reported on the above species of *Lotus*. In our collections the uredospores have 4-6 pores and the teleutospores are similar to *U. anthyllidis*. *U. gurkeanus* was reported on *L. edulis*, *L. peregrinus* and *L. halophilus* (*L. villosus*) from Greece (Petrak 1943a) but not on the above hosts.

e) *Uromyces hippocrepidis* Mayor

On *Hippocrepis ciliata* Willd. II, III (567), Crete.

The uredosori are up to 2 mm in diameter and the uredospores have mostly 4 pores.

f) *Uromyces hymenocarpi* O. Jaap

On *Hymenocarpus circinnatus* (L.) Savi II, III (49), Milina, Pelion; II, III (201), Kimi, Euboea; II, III (361), Ithaki; II, III (371), Zakynthos; II, III (548), Filiates, Epirus.

*Uromyces galegae* (Opiz) Sacc.

On *Galega officinalis* L. II, III (65), Milies, Pelion.

Uredosori mainly hypophyllous, up to 1.5 mm, erumpent, pulverulent, cinnamon brown; uredospores  $16-23 \times 16-22\mu$ , wall  $1-1.5\mu$  thick, pale yellow to yellow-brown, echinulate; pores 3-4, rarely 5, often equatorial, some scattered, with hyaline caps; teleutosori 0.2-0.5 mm, long-covered by the host epidermis; teleutospores  $20-27 \times 14-22\mu$ , irregular in shape, ellipsoid, some almost square, angular, wall  $3.0\mu$  thick, slightly thicker ( $3.5\mu$ ) at the apex with a small papilla, yellow-brown, verrucose, verrucae large  $0.6\mu$ ,  $0.5\mu$  apart, partially joined by low longitudinal ridges so that the spores appear striate; pedicels hyaline, fragile and cut off entirely from the base of the spore.

This rust has been reported before as *U. astragali* on the same host (Maire and Politis, 1940). *U. astragali* is considered as a race of *U. pisi* by modern

authors (Wilson and Henderson p. 331), however, we believe this rust is distinct from *U. pisi* in several characteristics (size of II and III spores ornamentation of III). It agrees well with Gäumann's (1959, p. 368) concept of *U. galegae* and until this species is more fully understood we recognise it as distinct from the many intricately related *Uromyces* on Leguminosae.

***Uromyces glycyrrhizae* (Rabh.) Magnus**

On *Glycyrrhiza glabra* L. O, II, III (381), Zakynthos.

Spermogonia all over the leaf surface or together with primary uredosori, amphigenous, large, paraphysate, uredosori either minute and dark cinnamon or larger, up to 1 mm, cinnamon, erumpent, pulverulent, often confluent; uredospores  $24-27 \times 20-25\mu$ , wall  $1.8-2.2\mu$  thick, pale yellow-brown, pores 2 equatorial,  $1.8\mu$  diam. with a clear area around them; teleutosori and teleutospores scarce in this collection.

This rust is rather common in Greece.

***Uromyces fabae* de Bary**

On *Lathyrus digitatus* (Bieb.) Fiori (*L. scantifolius*) II, III (501), Mt. Parnis, Attica; on *Vicia sativa* L. subsp. *nigra* (L.) Ehrh. II, III (483), Olympia; on *V. villosa* Roth. subsp. *varia* (Host) Corb. II, III (67), Milina, Pelion; III (447), Kefallinia; on *V. faba* L. II, III (578), Karteros, Crete; on *V. grandiflora* Scop. II, III (244), Skiathos; on *V. hybrida* L. II, III (382), Zakynthos; on *V. villosa* Roth subsp. *microphylla* (Urv.) P. Ball III (433), Kefallinia; II, III (162), Ghioura; on *V. cf. pinetorum* Boiss. & Spr. O? I, II, III (212), Kimi, Euboea; on *V. sativa* L. II, III (237), Skiathos; II, III (500), Mt. Parnis, Attica; II, III (577), Platanos, Crete.

Aecia were found only in the collection of *Vicia cf. pinetorum*. Generally the uredosori and teleutosori are amphigenous and the latter also occur on the stems; uredospores  $24-32 \times 18-26\mu$ , wall  $1.5-2.5\mu$  thick, echinulate, yellow-brown, pores 3-4 more or less equatorial; teleutospores  $27-38 \times 18-26\mu$ , apex rounded or truncate, wall  $1.5-2\mu$  thick at sides,  $7-11\mu$  thick at apex (on *V. villosa* subsp. *varia* some teleutospores have the side walls up to  $6\mu$  thick and up to  $9\mu$  thick at apex); pedicels fragile or persistent, subhyaline to yellowish.

*Lathyrus digitatus*, *Vicia villosa* subsp. *microphylla* and *V. cf. pinetorum* have not been reported before with rust. *V. villosa* subsp. *varia*, *V. grandiflora* and *V. hybrida* are new records for Greece.

***Uromyces nerviphilus* (Grognot) Hotson**

On *Trifolium fragiferum* L. III (128), Mt. Parnassos; on *T. repens* L. III (269) Hania, Pelion; II, III (573), Crete.

Teleutosori hypophyllous, 1-2 mm long, 3-4 cm long on the stems, long covered by the host epidermis, then erumpent, dark brown; teleutospores  $21-30 \times 15-22\mu$ , wall  $2\mu$  thick, smooth or with few verrucae arranged in lines, apical pore with a slight hyaline papilla; pedicels hyaline, fragile.

This rust has not been reported previously from Greece.

**Uromyces pisi** (DC.) Otth

On *Vicia* sp. III (127), Livadi, Mt. Parnassos.

Teleutospores  $21-30 \times 16-22\mu$ , wall  $2-2.5\mu$  thick, brown, verrucose, apical pore with a minute pale papilla.

On *Lotus corniculatus* L. II, III (29), Milina, Pelion.

The genus *Lotus* is attacked by races of both *Uromyces pisi* and *U. anthyllidis*. The rust on *Lotus corniculatus*, however, usually corresponds to *U. pisi* with fewer uredospore pores than *U. anthyllidis*.

**Uromyces striatus** Schroet.

On *Medicago sativa* L. II, III (145), Epirus.

Uredospores  $20-30 \times 20-24\mu$ , wall  $1.5-2\mu$  thick, yellow-brown, echinulate, mostly with 5 pores; teleutospores  $22-26 \times 20-23\mu$ , wall  $1.5-2.5\mu$  thick, verrucose, the verrucae arranged in lines.

**Uromyces seligeri** Tranz. & Erem.

On *Lathyrus grandiflorus* S. & S. O, I, III (133), Livadi, Mt. Parnassos; O, I (219), Livadi, Mt. Parnassos.

Spermogonia and aecia covering the lower leaves, stems and petioles; hypophyllous on the leaves; spermogonia prominent, brown, paraphysate, exuding white masses of spermatia; aecia systemic, small,  $0.2-0.3$  mm, ( $240\mu$  wide in section), white or pale yellow; peridia lacerate, peridial cells  $22\mu$  long, outer wall  $7-7.5\mu$  thick, striate; aeciospores  $14-20 \times 12-15\mu$ , wall  $0.5-1\mu$  thick, hyaline, densely echinulate. Uredosori absent; teleutosori on separate leaves, amphigenous, minute,  $0.2-0.5$  mm ( $480\mu$  in section), often long-covered by the host epidermis and greyish, then erumpent and blackish brown; teleutospores  $20-30(36) \times 18-24\mu$ , variable in shape, rounded, ellipsoid, angular, apex rounded or truncate, wall  $2-2.5\mu$  thick, apex in a few thickened up to  $7\mu$  smooth or with some lines; pedicels hyaline or yellow, fragile or persistent and up to  $35\mu$  long and  $6\mu$  wide.

This is the first record of a rust on *L. grandiflorus*. It seems clearly to be an opsis-form. The collection with O, I was made in May and that with O, I, III in August. The rust is clearly closely related to *Uromyces lapponicus*, an opsis-form with systemic aecia on *Astragalus* and *Oxytropis*, often conspicuous and common in montane and arctic regions. However, Tranzschel and Eremeeva's species *U. seligeri* was described (in Tranzschel 1939) on *Lathyrus sylvestris* from the vicinity of Lake Seliger (Kalinin). *Lathyrus grandiflorus* is allied to *L. sylvestris* so it is very probable that we are dealing with the same rust as Tranzschel & Eremeeva. Certainly from their description the fungi match perfectly.

**Uromyces spartii-juncei** Syd.

On *Spartium junceum* L. II (534), Kerkyra.

Uredospores  $22-27 \times 18-22\mu$ , wall  $1.5\mu$  thick, yellow-brown, pores mostly 3.



**Uromyces trifolii** (DC.) Lév.

On *Trifolium repens* L. I, II, III (223), Skiathos; on *T. physodes* L. II, III (292), Mt. Taygetos, Peloponnesus; O, I, II, III (357), Ithaki; II, III (485), Mt. Erymanthos, Peloponnesus.

Spermogonia large, paraphysate; aecia hypophyllous, and caulicolous, distorting the stems and petioles, peridial cells with outer wall  $7.5\mu$  thick, inner wall  $3-4\mu$ , verrucose; aeciospores  $18-22 \times 16-20\mu$ , wall  $1\mu$  thick, verrucose; uredosori and teleutosori amphigenous, minute, also caulicolous, erumpent, pulverulent, the first orange, the second dark orange-brown; uredospores  $22-26 \times 17-22\mu$ , wall  $1.2-1.5\mu$  thick, distinctly echinulate, pores 2 or 3, mostly 3, equatorial; teleutospores  $20-28 \times 20-24\mu$ , wall  $1.8-2.4\mu$  thick, yellow-brown, smooth or finely echinulate, apical pore with a slight pale papilla; pedicels hyaline, fragile.

*T. physodes* seems to be an entirely new host for the rust.

## LILIACEAE

**Uromyces muscari** (Duby) Lév.

On *Muscari comosum* (L.) Mill. III (190), Mt. Parnassos: III (579), Certe; *M. comosum* III (356), Ithaki.

## PLUMBAGINACEAE

**Uromyces limonii** (DC.) Lév.

On *Limonium angustifolium* (Tausch.) Turr. O, I, II, III (245), Skiathos; II, III (321), Skiathos; on *L. sinuatum* (L.) Mill. II (436), Sounio, Attica.

The uredosori are infected with *Tuberculina*. This rust is common in Greece.

## POLYGONACEAE

**Uromyces polygoni-aviculariae** (Pers.) Karst.

On *Polygonum aviculare* L. III (140), Mt. Parnis, Attica; O, I, II (544), Mt. Mourgana, Epirus.

The collection with teleutosori was found in October, the one with aecia in July at an altitude of 1800 m.

**Uromyces rumicis** (Schum.) Wint.

On *Rumex crispus* L. I, II (279), Zagora, Pelion; on *R. cristatus* DC. (*R. graecus*), II, III (198), Kimi, Euboea; on *R. obtusifolius* L. II, III (34), Milina, Pelion; on *R. pulcher* L. II, III (21), Ayiosyritica, Mantinia; II, III (384), Zakynthos.

*R. crispus*, *R. obtusifolius* and *R. pulcher* are new host records for Greece. The number of pores in the uredospores of these collections of *U. rumicis* is somewhat variable and ranges from two strictly equatorial to three more or less equatorial.

## SCROPHULARIACEAE

**Uromyces thapsi** (Opiz) Bubak

On *Verbascum* sp. O, I, III (364), Zakynthos.

The correct name for this rust may be *U. verbasci* Niessl.

Teleutospores  $22-30 \times 15-17\mu$ , apex thickened up to  $5.5\mu$ .



## HOST INDEX

Anagyris foetida	U. anthyllidis (U. anagyridis)
Anthyllis tetraphylla	U. anthyllidis
Anthyllis vulneraria	U. anthyllidis
Arenaria serpyllifolia	U. serpyllifolia
Dianthus sp.	U. dianthi
Dorycnium graecum	U. anthyllidis
Galega officinalis	U. galegae
Geranium rotundifolium	U. geranii
Geranium macrorrhizum	U. geranii
Glycyrrhiza glabra	U. glycyrrhizae
Hippocrepis ciliata	U. anthyllidis (U. hippocrepidis)
Hymenocarpus circinnatus	U. anthyllidis (U. hymenocarp)
Lathyrus digitatus (L. scantifolius)	U. fabae
Lathyrus grandiflorus	U. seligeri
Limonium angustifolium	U. limonii
Limonium sinuata	U. limonii
Lotus angustissimus var. minor	U. anthyllidis (U. gurkeanus)
Lotus corniculatus	U. pisi
Lotus creticus	U. anthyllidis (U. gurkeanus)
Lotus orithopodioides	U. anthyllidis (U. gurkeanus)
Medicago arabica	U. anthyllidis
Medicago truncatula	U. anthyllidis
Medicago turbinata	U. anthyllidis
Medicago sativa	U. pisi (U. striatus)
Muscari comosum	U. muscari
Pistacia terebinthus	Pileolaria terebinthi
Poa bulbosa	U. dactylidis
Poa trivialis ssp. silvicola	U. dactylidis
Polygonum aviculare	U. polygoni-aviculariae
Rumex crispus	U. rumicis
Rumex cristatus (R. graecus)	U. rumicis
Rumex obtusifolius	U. rumicis
Rumex pulcher	U. rumicis
Saponaria calabrica (S. graeca)	U. gypsophilae
Securigera securidaca (Bonaveria securidaca)	U. anthyllidis (U. bonaveriae)
Silene fabarioides	U. doricus
Silene graeca	U. verruculosus
Silene ionica	U. behenis
Silene vulgaris (S. inflata)	U. behenis
Spartium junceum	U. spartii-juncei
Trifolium campestre	U. anthyllidis
Trifolium fragiferum	U. nerviphilus
Trifolium physodes	U. trifolii
Trifolium pratense	U. trifolii
Trifolium repens	U. nerviphilus
Trifolium sp.	U. anthyllidis
Verbascum sp.	U. thapsi
Vicia faba	U. fabae
Vicia grandiflora	U. fabae
Vicia hybrida	U. fabae
Vicia cf. pinetorum	U. fabae
Vicia sativa	U. fabae
Vicia sativa ssp. nigra	U. fabae
Vicia villosa ssp. microphylla	U. fabae
Vicia villosa ssp. varia	U. fabae
Vicia sp.	U. pisi

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